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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/087,508 | 03/01/2002 | Seiji Yoshimura | 4321 | 4072 |

21553 7590 06/29/2004

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| EXAMINER | |
|---|---|
| MERCADO, JULIAN A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1745 | |

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/087,508 | YOSHIMURA ET AL. | |
| | Examiner | Art Unit | |
| | Julian Mercado | 1745 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-4 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Priority*

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on March 6, 2001 and February 15, 2002. It is noted, however, that applicant has not filed a certified copy of either of the applications as required by 35 U.S.C. 119(b).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-270259 (hereinafter JP '259) in view of Ebel et al. (U.S. Pat. 5,114,811).

For purposes of detailed discussion, the examiner relies on the machine translation of JP '259 as obtained from the JPO website http://www.ipdl.jpo.go.jp/homepg_e.ipdl.

Regarding claim 1, JP '259 teaches a lithium battery comprising a positive electrode containing manganese dioxide, wherein the positive electrode further contains boron. Given the formula $LiB_xM_yMn_{2-x-y}O_4$ JP '259 discloses that x is preferably 0.05 to 0.2 and substituting the molecular weight of Cr (which is one of the metals disclosed for M), the examiner calculates the weight percent of boron based on the following values: (refer to pars. [0007 – 0010]

Li mw = 6.941

B mw = 10.81

Cr mw = 51.996

Mn mw = 54.938

O mw = 15.9994

With x = 0.05 and y = 0.05 the formula calculates the weight percent of boron as follows:

Li (6.941 mw) + B (10.81 mw)(0.05) + Cr (51.996 mw)(0.05) + Mn (54.938 mw)(2-0.05-0.05) + O (15.9994 mw)(4) =

(6.941) + (0.5405) + (2.5998) + (104.3822) + (63.9976) =

178.4611 mw for $LiB_xM_yMn_{2-x-y}O_4$ when x and y = 0.05 and M = Cr.

Therefore, the weight percent of boron =

(0.5405)/(178.4611) =

0.30 %

With x = 0.2 and y = 0.2 the formula calculates the weight percent of boron as follows:

Li (6.941 mw) + B (10.81 mw)(0.2) + Cr (51.996 mw)(0.2) + Mn (54.938 mw)(2-0.2 - 0.2) + O (15.9994 mw)(4) =

(6.941) + (2.162) + (10.3992) + (87.9008) + (63.9976) =

171.4006 mw for $LiB_xM_yMn_{2-x-y}O_4$ when x and y = 0.2 and M = Cr.

Therefore, the weight percent of boron =

(2.162)/(171.4006) =

1.26 %

JP '259 is considered to teach the claimed boron at 0.1 to 3% by weight to the extent that by way of these two examples, the weight % of boron in JP '259 overlaps with the claimed range.

As to the negative electrode, JP '259 teaches a negative electrode made of lithium metal. (par. [0020]) While JP '259 does not explicitly teach a negative electrode containing 0.05 to 2% by weight of aluminum, Ebel et al. teaches an anode for a lithium battery comprising an alloy of lithium aluminum. (col. 3 line 33 et seq.) The amount of aluminum is from 0% to about 50% by weight. As to the claimed range of 0.05 to 2%, absent of unexpected results it is asserted that the amount of aluminum is an optimizable parameter for a result-effective variable. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980) Ebel et al. in fact teaches that "[t]he greater the amount of aluminum present by weight in the alloy the lower the energy density of the cell". (line 37-41)

As to claims 2 and 3, the process limitations therein are not given patentable weight as these limitations does not give breadth or scope to the product claim. The claimed product appears to be the same or similar to the prior art product insofar as being a positive electrode containing manganese dioxide and boron. In the event that any differences can be shown by the product of the product-by-process claims 2 and 3, such differences would have been obvious to the skilled artisan as a routine modification of the product absent of a showing of unexpected results. *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-52698. (hereinafter JP '698) in view of Ebel et al.

For purposes of detailed discussion, the examiner relies on the machine translation of JP '698 as obtained from the JPO website http://www.ipdl.jpo.go.jp/homepg_e.ipdl.

Regarding claims 1 and 4, JP '698 teaches a lithium battery comprising a positive electrode containing manganese dioxide, wherein the positive electrode further contains boron and phosphorus within the claimed ranges of 0.1 to 3% by weight of boron and 0.02 to 2% by weight of phosphorus. (par. [0012-0013]

As to claims 2 and 3, for similar reasons set forth above the process limitations are not given patentable weight as these limitations does not give breadth or scope to the product claim, with the claimed product appearing to be the same or similar to the prior art product insofar as being a positive electrode containing manganese dioxide and boron, and in the event that any differences can be shown by the product of the product-by-process claims 2 and 3, such differences would have been obvious to the skilled artisan as a routine modification of the product absent of a showing of unexpected results. *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

As to the negative electrode, JP '698 teaches a negative electrode made of lithium/aluminum metal alloy. (par. [0018]) While JP '698 does not explicitly teach a percent of 0.05 to 2% by weight of aluminum, as discussed above Ebel et al. teaches an anode for a lithium battery comprising an alloy of lithium aluminum, wherein the amount of aluminum is from 0% to about 50% by weight. As above, it is asserted that the amount of aluminum is an optimizable parameter for a result-effective variable in view of Ebel et al. teaching that "[t]he greater the amount of aluminum present by weight in the alloy the lower the energy density of the cell". (line 37-41) *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980)

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

jam

Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700